

Abstract

The present invention pertains to methods and pharmaceutical compositions for modulating an immune response. The method of the present invention involves administration of an effective amount of nucleic acid molecules encoding interleukin-12 (IL-12), interferon-gamma (IFN- γ), or a combination thereof, to a patient in need of such treatment. The pharmaceutical compositions of the invention contain nucleic acid molecules encoding IL-12 and/or IFN- γ and an operably-linked promoter sequence. In another aspect, the present invention concerns expression vectors containing a nucleotide sequence encoding IL-12 and IFN- γ , and an operably-linked promoter sequence. In another aspect, the present invention concerns cells genetically modified with a nucleotide sequence encoding IL-12 and IFN- γ .